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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/475,104	12/30/1999	NAGESH VODRAHALLI	042390.P6785	5963

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EXAMINER

MITCHELL, JAMES M

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 03/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/475,104

Applicant(s)

VODRAHALLI ET AL.

Examiner

James M. Mitchell

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 5-13 and 15-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the specification to support the encapsulant differing in composition from the thermal epoxy.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5-13 and 15-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 5-13 and 15-23 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationship is: the placement of the encapsulant with respect to the other structures.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-13, and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang et al. (US6, 208,519) in combination with Beane (US. 6,003,586) and Fillion et al. (US 6,306,680).

7. Jiang (Fig 4, 5) discloses a method for assembling an integrated circuit package, comprising: applying a compliant, thermal adhesive (152) to a top surface of an integrated circuit (112), placing a thermal element (142) that distributes heat over an are and therefore is a spreader adjacent to the thermal adhesive; and curing the thermal adhesive and applying an encapsulant (150; non thermal) differing in composition from the thermal adhesive after curing of the thermal adhesive; and mounting the integrated circuit to a substrate (step 200); and attaching a solder ball (123) to the substrate; wherein the applying of the encapsulant comprises molding (Abstract) the encapsulant onto the substrate and the integrated circuit.

8. Jiang does not appear to disclose that the adhesive is an epoxy containing a thermally conductive filler of carbon or curing the epoxy with energy at a microwave frequency.

9. However, Beane (Col. 5, Lines 16-21) utilize a compliant, epoxy that inherently contains a thermally conductive filler of carbon particles (via thermal epoxy; per applicant's admission, CLM 14 & 15 filed 09/27/ 2001).

10. It would have been obvious to one of ordinary skill in the art to form the compliant material of Jiang as a thermal epoxy in order to provide a compliant layer as required by Jiang (step 210).

11. As to curing by microwave frequency, Fillion (Col. 4, Lines 62-66) utilizes a microwave frequency to cure epoxy via an inherent microwave generator selecting a frequency to cure epoxy without damaging IC (via patent presumed valid; i.e. operational), wherein the microwave generator is inherently directed toward the epoxy (via epoxy is cured).

12. It would have been obvious to one of ordinary skill in the art to utilize energy at a microwave frequency with the modified epoxy structure of Jiang and Beane, in order to cure an encapsulant as taught by Fillion (Col. 4, Lines 62-66) and that is required by Jiang (step 230).

13. Claims 19, 21, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang, Beane and Fillion in combination with AGEN (JP62-36091).

14. Jiang, Beane and Fillion disclose the elements of paragraphs 7-12 of this office action, but do not appear to disclose baking the substrate into/onto which the IC is to be mounted.

15. AGEN teaches baking the substrate into/onto, which the IC is to be mounted (Title).

16. It would have been obvious to one of ordinary skill in the art to incorporate baking the substrate of Jiang into/onto which the IC is to be mounted, in order form metallization of the substrate as taught by AGEN (Title) and required by Jiang (130).

Response to Arguments

17. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection. The following comments are in response to applicant's arguments that may still be applicable.

18. Applicant contends that Fillion does not show the epoxy situated on a top surface. Examiner respectfully disagrees. Without express claim language defining the geographic location of the top surface of an item, any surface is the top surface subject to the viewer's interpretation (chips are mounted in various angles and positions). Furthermore, Fillion was not relied for that teaching, but only to show the ability to cure epoxy by a microwave frequency.

19. Applicant contends that the prior art does not suggest that baking occurs "prior to curing of the thermal epoxy;" the point is moot because there is no claimed sequential limitation for the baking step.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

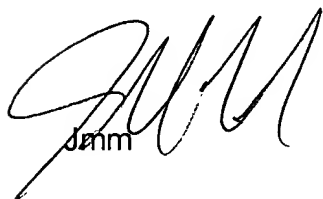
§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 6:30-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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DAVID E. GRAYBILL
PRIMARY EXAMINER